



The Radiation Monitoring and Abort System

The Shift Crew's Responsibilities

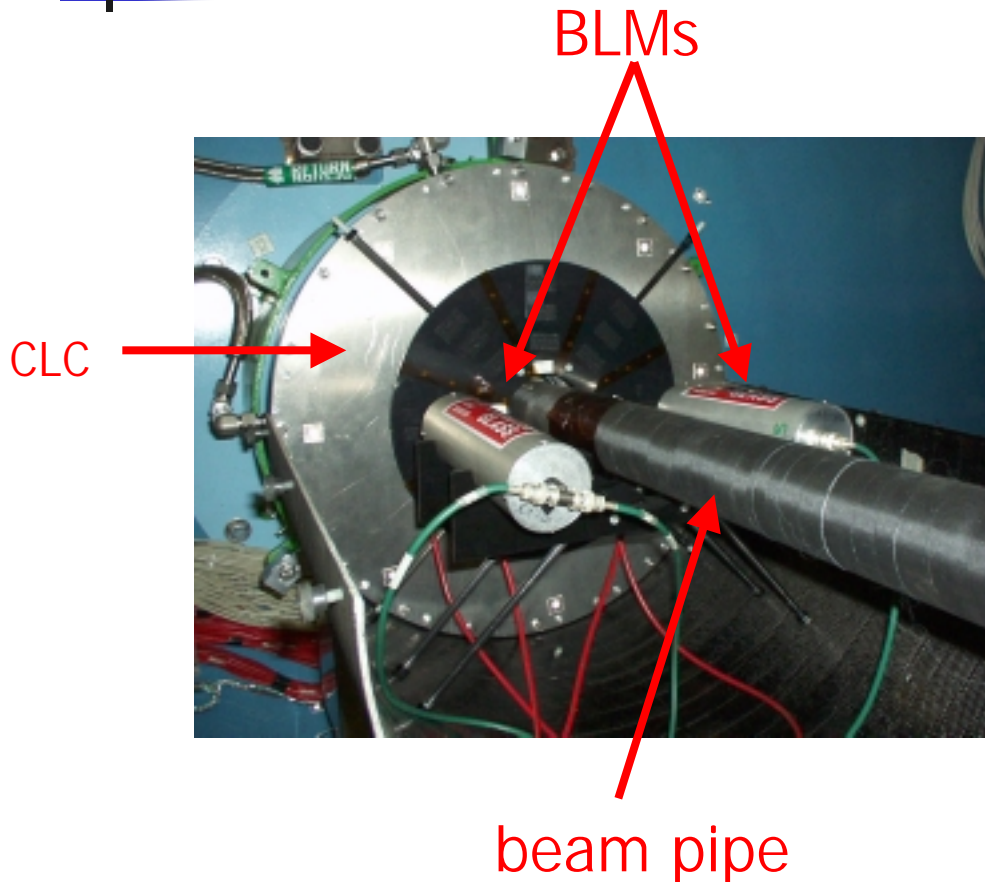


What the system does

Protects the silicon against excessive dosage by

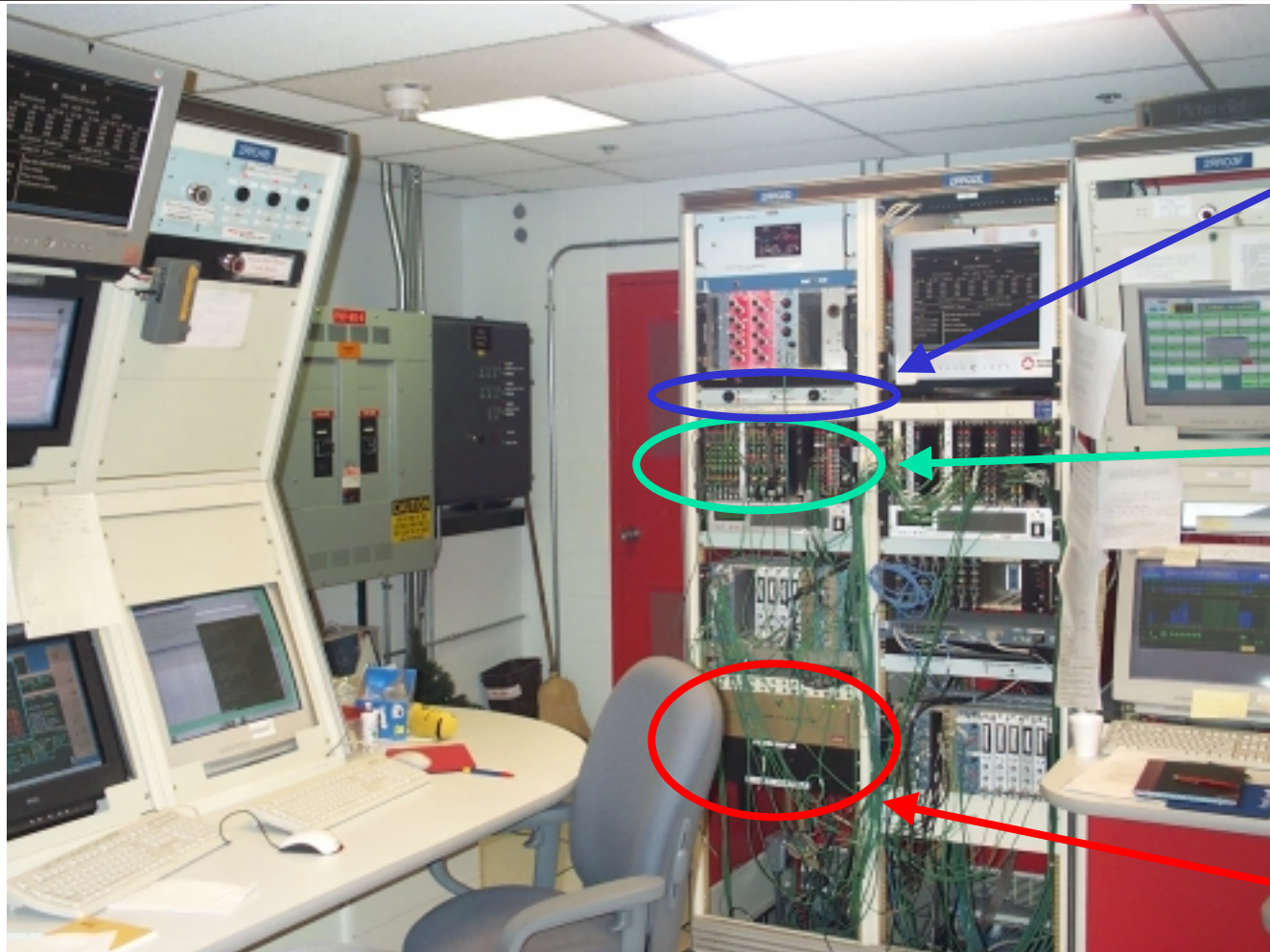
- **A-** Comparing dose rate against programmable threshold
 - If dose rate too high, abort the beam
- **B-** Comparing dose integrated over past minute against programmable threshold
 - If dose too high, sound alarm
- **C-** Keeping continuous record of integrated dose. You must watch this.

The hardware



- Beam Loss Monitors: two on E, two on W
- Output signal prop. to dose rate
- Amplified/digitized in CAMAC in control room
- Read out via ACNET

The electronics



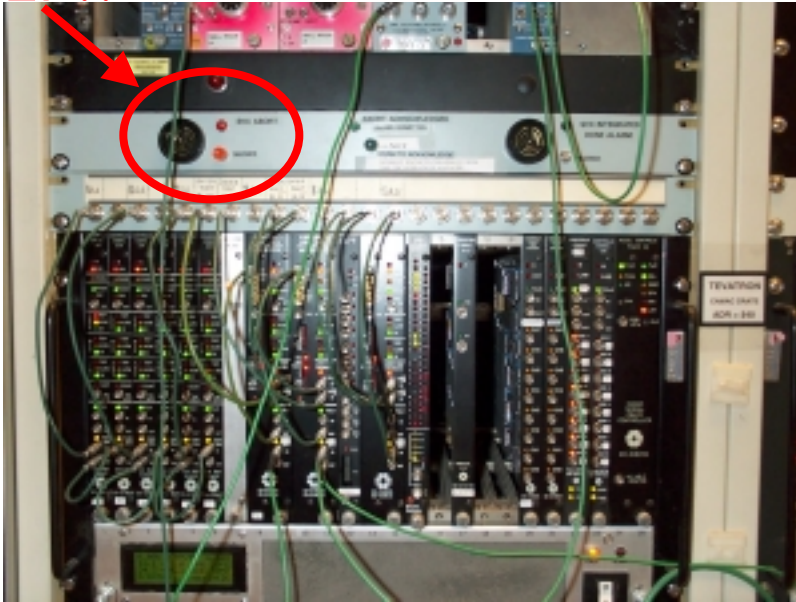
alarm
panel

CAMAC –
digitization
and abort
logic

HV

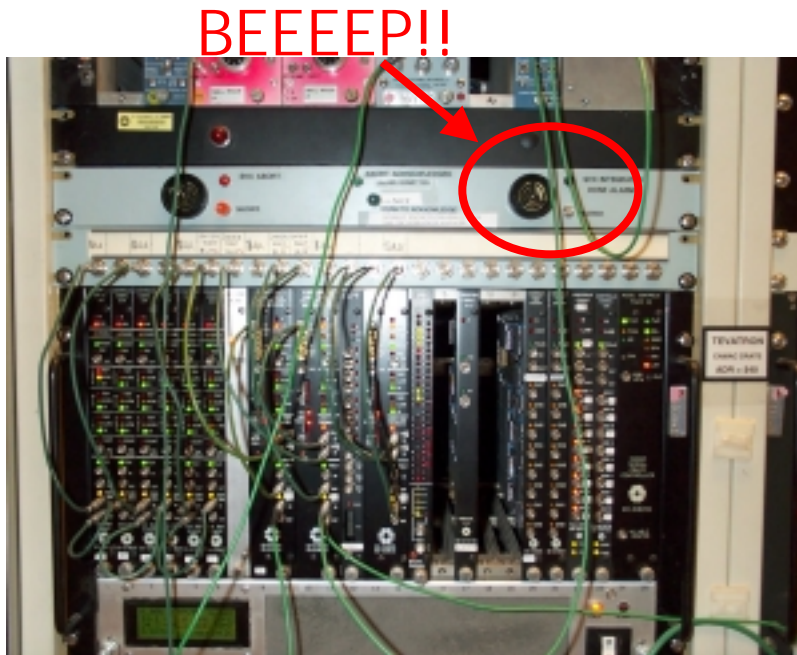
A- If there is an abort...

BEEEEEP!!



- Don't panic --- what's done is done
- Silence the sono-alarm
- SciCo calls MCR, RDCO, Ops Mgr
 - Probably a good idea to call silicon too
- Reset the system after Ops Mgr gives the OK
 - Step-by-step instructions on the RadMon web pages

B- If there is an alarm...



- Don't panic --- but be concerned
- Silence the sono-alarm
- SciCo should call MCR, RDCO.
 - Probably a good idea to call silicon too
- Be extra-vigilant about watching the E:SVRADs

What are the SVRADs ?
See next slide.

C- Monitoring

```
E2 SVX Rad Scaler Readout ♦Pgm_Tools♦
*Global Reset
*Plot FIFO
*Select Display Options
*Display Logged Data
Fifos Recording

Rate (R/s) Sum (Rads)
W Inner BLM .0035407 74.4743
W Outer BLM .0033581 0
E Inner BLM .0044799 0
E Outer BLM .0026043 74.47369

Messages
Welcome to the SVX Loss Monitor Page
```

- ACNET E2 shows real-time readings
- Whenever beam in TeV, you must monitor integrated doses (E:SVRAD0-3)
- Preferred method is a Fast Time Plot
 - Available from "SVX" menu on ACNET E-Z Writer page (E11)



What to watch for

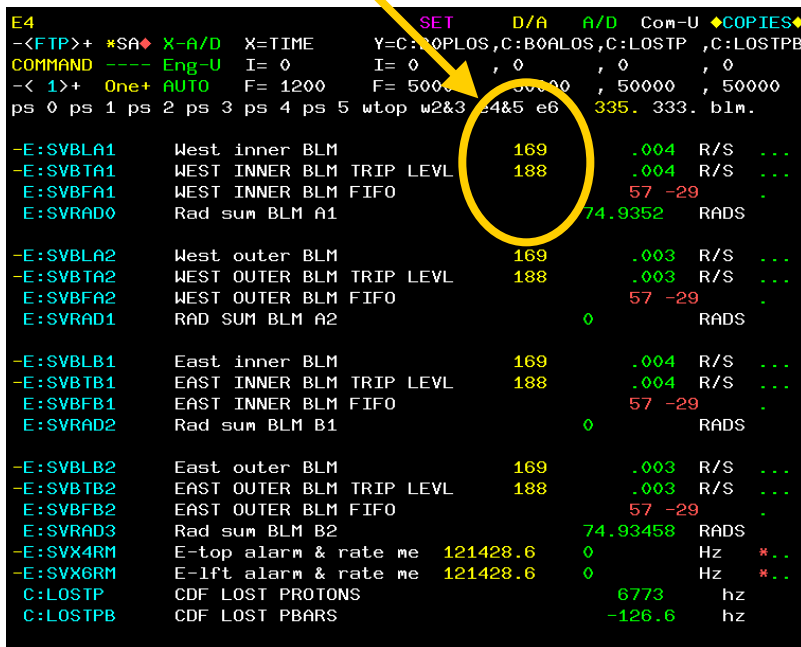
- Anomalous behavior of the E:SVRAD's
 - In time you'll get used to what is anomalous and what isn't
- Large integrated doses w.r.t. three thresholds:
 - "CDF manual alarm" --- SciCo calls MCR
 - "MCR manual abort" --- MCR aborts beam
 - "CDF manual abort" --- CDF aborts beam
- Integrated dose alarm will probably sound before these thresholds are reached, but be vigilant anyway!

threshold increase



How to manually abort the TeVatron

thresholds



E4	SET	D/A	A/D	Com-U	COPIES
-<FTP>+ *SA X-A/D X=TIME	Y=C:LOPLOS,C:BOALOS,C:LOSTP	C:LOSTPB			
COMMAND	Eng-U	I= 0	I= 0	I= 0	I= 0
-< 1>+ One+ AUTO	F= 1200	F= 5000	F= 5000	F= 50000	F= 50000
ps 0 ps 1 ps 2 ps 3 ps 4 ps 5	wtop w2&3 w4&5 e6	335.	333.	blm.	
-E:SVBLA1	West inner BLM	169	.004	R/S	...
-E:SVBTA1	WEST INNER BLM TRIP LEVEL	188	.004	R/S	...
E:SVBFA1	WEST INNER BLM FIFO		57 -29		
E:SVRAD0	Rad sum BLM A1		74.9352	RADS	
-E:SVBLA2	West outer BLM	169	.003	R/S	...
-E:SVBTA2	WEST OUTER BLM TRIP LEVEL	188	.003	R/S	...
E:SVBFA2	WEST OUTER BLM FIFO		57 -29		
E:SVRAD1	RAD SUM BLM A2		0	RADS	
-E:SVBLB1	East inner BLM	169	.004	R/S	...
-E:SVBTB1	EAST INNER BLM TRIP LEVEL	188	.004	R/S	...
E:SVBFB1	EAST INNER BLM FIFO		57 -29		
E:SVRAD2	Rad sum BLM B1		0	RADS	
-E:SVBLB2	East outer BLM	169	.003	R/S	...
-E:SVBTB2	EAST OUTER BLM TRIP LEVEL	188	.003	R/S	...
E:SVBFB2	EAST OUTER BLM FIFO		57 -29		
E:SVRAD3	Rad sum BLM B2		74.93458	RADS	
-E:SVX4RM	E-top alarm & rate me	121428.6	0	Hz	...
-E:SVX6RM	E-lft alarm & rate me	121428.6	0	Hz	...
C:LOSTP	CDF LOST PROTONS		6773	hz	
C:LOSTPB	CDF LOST PBARS		-126.6	hz	

- Step-by-step instructions on RadMon web pages
- In a nutshell:
 - Go to E4
 - Lower automated abort threshold to below pedestal
 - Let hardware take care of the rest



FAQ

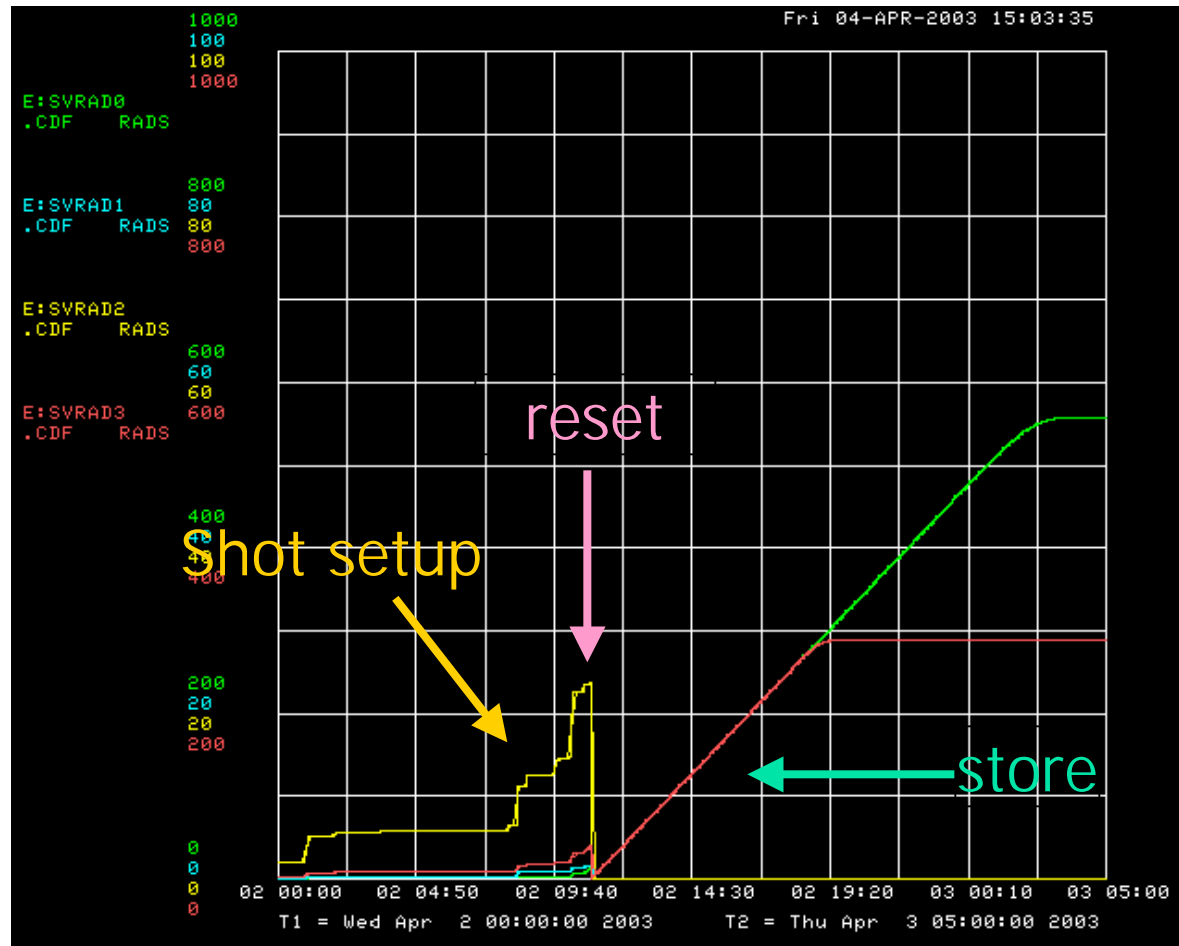
- What are the thresholds?
 - Automated abort: 12 rad/s
 - Integrated dose alarm: 18 rad in past minute
 - Manual alarm/aborts: ~krads, depends on what MCR is doing --- see table posted by ACNET console
- How long will silicon “last?”
 - ~Mrads, so don't worry.
- Has CDF ever pulled the manual abort?
 - Not on purpose.



FAQ, cont.

- When do the E:SVRADs get zeroed?
 - Before shot setup, after scraping, before studies --
- this is done by MCR
- Why are the E:SVRADs flat and boring most of the time?
 - System geared toward catastrophic beam accidents --- tens or hundreds of rad/s
 - Typical beam losses \sim mrad/s --- indistinguishable from zero --- an effective integration threshold
 - Threshold for E:SVRAD0,3 is 2 mrad/s, E:SVRAD1,2 is 8 mrad/s (long story)

Typical dose behavior



If you've forgotten everything I just said...

The image shows two Netscape browser windows. The left window, titled "Monitoring Ace Information", displays a page with a sidebar containing links like "Monitoring Ace Checklist", "Fix Detectors Info/Recovery", and "Monitoring Aces Next Read". A red circle highlights the "Fix Detectors Info/Recovery" link, with a red arrow pointing to a table in the right window. The right window, titled "The Silicon Radiation Monitoring and Abort System Page", contains a table with various system components and their recovery procedures. A red circle highlights the "COT HV" row in the table, with a red arrow pointing to it from the left window.

Monitoring Ace Information

Don't May

Things every A

Monitoring

- Monitoring Ace Checklist
- Fix Detectors Info/Recovery**
- Monitoring Aces Next Read
- Accelerator Network (ACNET)

Resources

- Palm Pilot resources for ACEs
- RunList via DB query tool
- Index of DAQ and calibration error log

Shift Schedules

The Silicon Radiation Monitoring and Abort System Page

Overview of the system
Instructions for the Monitoring ACE
Using ACNET to monitor radiation
How to manually abort the Tevatron beams
How to respond to alarms and aborts
Expert contact info
A picture of Amy Grant making the devil sign

Last updated on 28-FEB-2001
by Andy Hocker

CDF iFix Slow	Controls (MCS)	ACNET - Beam Quality
Intro to iFix iFix Problems HV Global Page Alarm Global Page	Web-Server Pics Access Security	Tutorial Shot Setup - Re Aces' ACNET Beam Quality

Legend: READY, Preliminary
In case of problems with systems that do not yet have recovery procedures

COT HV	MUONS - HV	CES-CCR-6
Instructions to Shift Trip Recovery	Instructions to Shift Trip Recovery	Instructions to Shift Trip Recovery

SVX, ISL, L00	CSX, CSP/W B/TSU MSK	Shift Instruction
Instructions to Shift Cooling/TS Recovery Procedures Recovery Procedures	Instructions to Shift Trip Recovery	Shift Instruction

MNP	BSC, RPS	CLC
Instructions to Shift PC restart	Instructions to Shift PC restart	Instructions to Shift PC restart

PC BACKUP	xxx	Template
Procedure What Remains Other Info	Not Available	Tutorial Instructions to Shift Recovery Procedures



Summary

- Monitor E:SVRADs whenever beam in TeVatron
- If high doses observed, check them against manual alarm/abort threshold table and alert MCR
- Page RDCO for all alarms, aborts, or if something looks weird
 - Andy Hocker, Ricardo Eusebi, Eva Halkiadakis
- Take a spin through the RadMon web pages on one of those boring TeV studies shifts...